AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1. (**Currently Amended**) A method for ~~processing~~ converting an original color image into a monochromatic image said conversion being made with a minimal lose of information, the method comprising the following steps:

converting the original color image made of pixels, each pixel being represented by hue H, saturation S and value V components ~~H, S, and V~~ in a color space, or by hue H, luminescence L and saturation S components ~~H, L, and S~~ in a HLS color space into an intermediate image made of pixels, each pixel being represented by components X and Y~~; wherein components X and Y depend~~ depending solely on the H and S components of the pixel in the original color image; wherein components X and Y are functions of the H component determined by:

$$X = G_X(H) \text{ and } Y = G_Y(H);$$

wherein these functions verify the following relationships:

$$G_X(0) = G_X(1) \text{ and } G_Y(0) = G_Y(1);$$

(b) generating a new monochromatic image from the intermediate image; wherein the intermediate image each pixel is represented only by a component D1; ~~wherein~~ D1 [[is]] being a function of components X and Y of the pixel in the intermediate image.

2. (Previously Presented) The method according to claim 1, wherein components X and Y are functions of the H and S components determined by:

$G'_X(H,S)$ and $G'_Y(H,S)$,

these functions verify the following relationships:

$G'_X(0,S) = G'_X(1,S)$ and $G'_Y(0,S) = G'_Y(1,S)$

$$\lim_{S \to 0} G'_X(H,S) \to 0 \text{ and } \lim_{S \to 0} G'_Y(H,S) \to 0$$

3. (Previously Presented) The method according to claim 2, wherein $G'_X(H,S)$ and $G'_Y(H,S)$ are monotonic and continuous functions of the S component.

4. (**Currently Amended**) The method according to claim 1, wherein the new monochromatic image is generated by applying a Karhunen-Loève transformation, or a linear approximation of this transformation, to the intermediate image and using only the most discriminatory component D1 to represent each pixel of the new image.

5. (**Currently Amended**) A method for processing an original color image, the method comprising the following steps:

(a) converting the original color image into an intermediate image made of pixels, each pixel having components that depend solely on hue H and saturation S components of the pixels in the original color image in an HSV or HLS representation;

wherein the intermediate image is made of pixels, each pixel ~~comprises~~ comprising two components X and Y, determined by functions of the H component, theses functions take the same value when the H component is zero or equal to one;

(b) generating a new monochromatic image ~~having only one component~~ from the intermediate image, said new monochromatic image being made of pixels, each pixel

having only one component[[;]] ~~wherein the component of this image being~~ which is a function of the components of the corresponding pixel in the intermediate image;

wherein the new monochromatic image is generated by projecting the components of the pixels of the intermediate image in a plane in which a dynamic range or mean standard deviation is the greatest.

6. (**Currently Amended**) The method according to claim 1, wherein a filtering is performed on the darkest and the lightest pixels, which represent a determined fraction of the total number of pixels of the new monochromatic image.

7. (Previously Presented) The method according to claim 5, wherein the dynamic range of the new image is adjusted to a total available dynamic range.

8. (Previously Presented) The method according to claim 1, wherein $G_X(H)$ and $G_V(H)$ are defined by:

$$GX(H) = \cos(2\pi H - \varphi) \text{ and } GY(H) = \sin(2\pi H - \varphi);$$

where φ is a constant.

9. (**Currently Amended**) The method according to claim 3, wherein the new monochromatic image is generated by applying the Karhunen-Loève transformation, or a linear approximation of this transformation, to the intermediate image and using only the most discriminatory component D1 to represent each pixel of the new image.

10. (**Currently Amended**) The method according to claim 3, wherein the new image is generated by projecting the components of the pixels of the intermediate image in the plane in which the dynamic range or mean standard deviation is the greatest.

11. (**Currently Amended**) The method according to claim 1, wherein the new monochromatic image is generated from a combination of an image made of pixels having components X and Y with additional texture attributes of the image having components X and Y.